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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,705	03/29/2004	Yifan Gong	TI-37146	1350
23494 7590 02/26/2008 TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			EXAMINER STOFFREGEN, JOEL	
			ART UNIT 2626	PAPER NUMBER
			NOTIFICATION DATE 02/26/2008	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/811,705

Applicant(s)

GONG ET AL.

Examiner

Joel Stoffregen

Art Unit

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/ are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Amendment

2. This communication is in response to applicant's amendment dated November 19, 2007. The applicant amended claims 1-7 and 9-14. The previous objections to claims 3 and 4 are withdrawn. The previous rejections of claims 1, 6-9, and 14 under 35 USC 112 are withdrawn. Claims 1-14 are currently pending in this application.

Response to Arguments

3. Applicant's arguments with respect to rejections under 35 USC 102/103 have been fully considered but they are not persuasive. The applicant argued that Tsuboka (5,129,002) fails to disclose "calculating a correction item for an adjustable bias based on each new observation" (see applicant's remarks, p. 5). The examiner respectfully disagrees. Denominator and numerator values are calculated for each observed word in word pattern W_r (see column 14, lines 25-27). These denominator and numerator values are then summed and used to estimate a parameter associated with the word (see column 14, lines 34-37). It would be unnecessary to sum them if they were the same value for every observed word. Therefore the denominator and numerator values are based on "each new observation used in recognizing the signal".

Claim Objections

4. **Claims 2 and 9** are objected to because of the following informalities:

Claim 2 recites the indefinite phrase "can be". It is unclear whether the limitation(s) following the phrase are part of the claimed invention.

Claim 9 recites the indefinite phrase "could be". It is unclear whether the limitation(s) following the phrase are part of the claimed invention.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. **Claim 12** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "every fixed length" renders the claim indefinite because it is unclear what length of speech signal is used.

Claim Rejections - 35 USC § 102

6. **Claims 1, 2, and 6-14** are rejected under 35 U.S.C. 102(b) as being anticipated by Tsuboka, Patent No. US 5,129,002 ("TSUBOKA").
7. Regarding **claim 1**, TSUBOKA teaches a method of updating bias of a signal model in a sequential manner (FIG. 7), comprising the steps of:

introducing an adjustable bias in a distribution parameter of a Hidden Markov Model of a signal ("the mean of the probability density for generating the feature vector in the state within the same state may vary linearly", column 14, lines 48-50);

calculating a correction item for the adjustable bias based on each new observation used in recognizing the signal ("the denominator and numerator ... are calculated", column 14, lines 25-27); and

updating the adjustable bias by adding the correction item thereto ("obtains the ratio from the cumulative sums of the denominators and numerators in state i ... and calculates a new estimated value of the parameter in state i ", column 14, lines 34-38).

8. Regarding **claim 2**, TSUBOKA further teaches that the adjustable bias can be defined on each state of the HMM ("calculates a new estimated value of the parameter in state i ", column 14, lines 38-39).

9. Regarding **claim 6**, TSUBOKA further teaches that the correction term is calculated based on both current model parameters ("provided with proper values $\lambda = \{\mu, u, \gamma, \Sigma\}$ as initial values", column 14, lines 29-30) and the new observation ("training word pattern W_r ", column 14, line 33).

10. Regarding **claim 7**, TSUBOKA further teaches that the correction term is calculated based on both information derived from all signals provided to a recognizer for said recognizing ("provided with proper values $\lambda = \{\mu, u, \gamma, \Sigma\}$ as initial values",

column 14, lines 29-30) and the new observation ("training word pattern W_r ", column 14, line 33).

11. Regarding **claim 8**, TSUBOKA further teaches that the signal comprises a speech signal (see FIG. 7, "voice input").

12. Regarding **claim 9**, TSUBOKA further teaches that new available data from the new observation could be based on any length (see column 14, lines 33-34, the length varies from one word to R words).

13. Regarding **claim 10**, TSUBOKA further teaches that the new observation is a frame ("input voice signal is converted into a sequence $X=x_1, x_2, \dots, x_T$ of feature vectors, in T is the number of frames", column 1, lines 25-27).

14. Regarding **claim 11**, TSUBOKA further teaches that the new observation is an utterance (see column 14, lines 33-34, the calculation is based on an utterance of one word to R words).

15. Regarding **claim 12**, as best understood in view of claim rejection under 35 USC 112 2nd (see above), TSUBOKA further teaches that the new observation is every fixed length of the signal (see column 14, lines 33-34, the length varies from one word to R words).

16. Regarding **claim 13**, TSUBOKA further teaches that the new observation is based on every 10 minutes of the signal (see column 14, lines 33-34, the length varies from one word to R words, R being an arbitrary value that represents any length of time, depending on how many words are spoken and how quickly they are spoken).

17. Regarding **claim 14**, TSUBOKA further teaches that the correction item is a product of any sequence whose limit is zero, whose summation is infinity and whose square summation is not infinity (see column 13, equations on lines 5-19, the terms are in the form of $1/N$) and the summation of quantities weighted by a probability, the quantities are based on the divergence of desired model parameter and observed signal (see column 13, equations on lines 5-19, $P(w_r | \lambda)$).

Claim Rejections - 35 USC § 103

18. **Claims 3, 4, and 5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuboka, Patent No. US 5,129,002 ("TSUBOKA"), in view of Chien et al., Patent No. US 6,662,160 ("CHIEN").

19. Regarding **claim 3**, TSUBOKA teaches all of the claimed limitations of claim 1.

However TSUBOKA does not disclose that the adjustable bias is shared among different states of the HMM.

In the same field of model adaptation, CHIEN teaches an adjustable bias that is shared among different states of an HMM ("bias compensation vector $b(\lambda)$ is shared by all HMM units", CHIEN, column 4, lines 58-59).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the bias vector of CHIEN with the model adaptation method of TSUBOKA in order to avoid a "data sparseness problem" (CHIEN, column 4, line 61).

20. Regarding **claim 4**, CHIEN further teaches that the adjustable bias is shared by groups of states of the HMM ("bias compensation vector $b(\lambda)$ is shared by all HMM units", CHIEN, column 4, lines 58-59).

21. Regarding **claim 5**, CHIEN further teaches that that the adjustable bias is shared by all states of the HMM ("bias compensation vector $b(\lambda)$ is shared by all HMM units", CHIEN, column 4, lines 58-59).

Conclusion

22. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joel Stoffregen whose telephone number is (571) 270-1454. The examiner can normally be reached on Monday - Friday, 9:00 a.m. - 6:30 p.m..

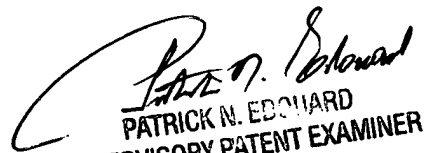
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS


PATRICK N. EDOUARD
SUPERVISORY PATENT EXAMINER